

<p style="text-align: center;"><b>NEW CONSTRUCTION OF ONE AND TWO FAMILY DWELLINGS REQUIREMENTS FOR CONSTRUCTION DOCUMENTS</b></p>
--

## **I. PURPOSE**

The purpose of this document is to provide the minimum expectations for construction document submissions.

## **II. GOALS**

The benefits of these requirements are three fold:

1. Designer can produce approvable construction documents that can be used in the field to comply with the code resulting in:
  - A. Construction documents that can be followed in field to achieve code compliance and reduce costly mistakes,
  - B. Regional consistency and uniform enforcement,
2. Plan reviewer will receive plans which are readily reviewable for code compliance resulting in:
  - A. Clear, complete, consistent, code compliant, construction documents,
  - B. More “first time” approvals resulting in faster permit issuance,
3. Inspectors will receive approved construction plans that can be understood by the inspector and contractor during inspections resulting in:
  - A. Structurally sound code compliant houses
  - B. Reduced homeowner complaints
  - C. Fewer rejections, reduced confusion, efficient inspections

## **III. ORGANIZATION OF THESE REQUIREMENTS**

Requirements for construction document submittals are divided into four areas:

- A. **Process issues** which facilitate the reading and understanding of construction documents
- B. **Technical issues** which assure code compliant design
- C. Specific instances when “**sealed**” **construction documents** are required

## **IV. PROCESS ISSUES**

1. In order to achieve single source accountability, a structural coordinator is required to be identified for each submittal. The term *Structural Coordinator* implies the person to whom the General Contractor has delegated the responsibility of assuring the construction document set is clear, complete, consistent, and correct. The Structural Coordinator may be the General Contractor or his agent, engineer, architect or designer and is the point person for all technical questions concerning the project.
2. All drawings/construction documents shall be coordinated to accurately reflect the specific materials and their arrangement to accurately reflect the proposed construction. Unused options not applicable to the specific project shall be purged out of the drawings/construction documents prior to submittal. Drawings for mechanical, electrical, or plumbing systems, as well as cabinetry and trim details are not required, and shall not be submitted.

3. Plans shall be submitted in standard architectural scale (1/2", 1/4", 3/16", or 1/8"). Care should be taken when the drawings are reduced to fit on a specific piece of paper that they remain in a standard scale.
4. All drawing sheets shall be numbered for easy cross-reference.
5. All plan sheets within the construction documents shall have the same orientation. Reversed or "opposite hand" sets of drawings are permitted provided that all the sheets within the construction document set are consistently oriented.
6. Plans shall bear the name, address, phone number and occupation of the author and the Structural Coordinator.
7. Construction documents will be legible, and in a readable font. Handwritten notes/changes shall be clearly readable and structurally pertinent or otherwise eliminated.
8. Original County stamped plans must be on site for use by the inspector and contractor for all building inspections.
9. Engineering calculations are not required where a Registered Design Professional (RDP) seals the plans for specific structural elements or for the entire house, or submits a letter specifically identifying that he has reviewed the plans for structural adequacy. In accordance with Section 111.5.2 of the Virginia Uniform Statewide Building Code, plan reviewers may require sufficient technical details (including calculations) to be submitted to determine code compliance of a RDP's submittal.
10. Where inspectors question the code compliance of a structural detail clearly shown on the approved plans, it shall be the inspectors' responsibility to coordinate the resolution of this with the contractor and plan reviewer within two working days.
11. Plans should be identified with a model name other than the client name to allow reviewers to identify similar plans which have been previously reviewed.

## **V. TECHNICAL ISSUES**

1. The following drawings are required (as applicable):
  - A. Foundation or basement plan
  - B. Floor plan for each level
  - C. Unfinished attic plan - if walk-up stairs are provided to a *potentially habitable* space, the floor shall be calculated for 40 psf live load or 30 psf live load if marked as a bedroom or future bedroom. Future bedrooms also require that emergency egress windows and roughed-in connections to the smoke detectors be provided.
  - D. Roof plan identifying the framing members and roof covering (e.g. shingle, shake, slate, tile, etc.)
  - E. Four exterior elevations
  - F. Structural details for tall walls greater than 10' in height and 8' width
  - G. Cross-sections depicting the structural framing conditions. Wall section details are only necessary for unique framing conditions not shown elsewhere on the plans.
  - H. Dimensioned truss layout plan and corresponding truss detail sheets. Bottom chord truss loading of 20 psf for limited storage shall be applied only to those areas with a height of 42" or greater.
  - I. Dimensioned engineered product plans with corresponding details including blocking. This information may also be provided as part of the framing or floor plan.

## 2. Roof systems

- A. A house with hip roof is defined as “complex” if any of these conditions apply:
  - 1. The house is >32' wide perpendicular to direction of the ridge
  - 2. The house has a nonsymmetrical roof layout (excludes overbuilt roofs and overbuilt dormers)
  - 3. The house has a true valley
  - 4. The roof pitch is less than 3:12

For houses with complex roof framing systems, all hips and valley members shall be treated as *beams* and have king posts supported to the foundation. If the house is not considered complex, the ridge and hip members can be considered as balanced.

- B. Ridge beams are required for roof pitches < 3:12 or where lower rafter ends are not restrained against lateral thrust.
- C. For shed/dutch dormer, unbalanced rafter systems, a ridge board is acceptable if there is less than 42" of clearance in the attic space, the roof pitch is greater than 3:12 for both roofs, and the rafter span for the rafter supporting the ceiling joist is at least 20% less than the maximum allowed by the appropriate IRC table for roof rafters. Outside of these parameters, a ridge supported and designed as a beam or a sealed engineered solution is required.
- D. Rafters framed into ridge and valley beams shall be supported by rafter hangers or ledger boards.

## 3. Identification of structural members:

- A. All wood members shall be identified by species, nominal dimensions, and spacing (example: SPF 2x8 @ 16" o.c.).
- B. Engineered wood I-joists shall be identified by size, manufacturer, series, and spacing (e.g. 14" TJI, Pro 130 @ 19.2" o.c.).
- C. Engineered wood beams shall be identified by manufacturer, quantity, size and E value (example: TJI, (3) 9-1/2", E=1.9, LVL).
- D. Steel studs, rafters and joists shall be identified by member designation or size and gauge, and spacing (e.g. 350S162-33 @ 16" o.c. or 3-1/2", 20 gage stud @ 16" o.c.).
- E. Steel shapes shall be identified by shape, depth, and weight (e.g. W12x22).

## 4. Point loads and reactions

- A. The location of all point loads in excess of 4000 pounds, and all king posts, shall be depicted or shaded to show the load path from its origin to the foundation and footing.
- B. The header sizes in load bearing walls shall be provided adjacent to each window/door.
- C. Columns
  - 1. Wood shall be identified by grade and species or will be assumed to be SPF *stud grade*. The number of studs in a built up wood column shall be indicated on the plans.
  - 2. A maximum of five studs is permitted without an engineered design
  - 3. Engineered wood products or steel shall be identified on the plans accompanied by details for the materials selected.
- D. Manufacturer's blocking details shall be provided for all **engineered wood products**
- E. The specific make and model of beam, girder, and truss hangers shall be identified on the plans for hangers supporting all multiple ply trusses or when the supported reaction is over 2500#

5. Deck plans shall indicate all beam, girder, post and footing sizes. If the deck is attached to the house, it shall be bolted to a treated band board or bolted through masonry (not brick veneer).
6. Fire rated walls shall be identified with the testing lab details/design numbers.

## **VI. PLANS REQUIRING THE SIGNATURE AND SEAL OF A REGISTERED DESIGN PROFESSIONAL (ENGINEER)**

1. All retaining walls with unbalanced fill greater than 4'
2. Basement walls without both stone fill and drain tile in accordance with Tables 404.1.1 (1, 2, 3 & 4)
3. Tall walls with studs that exceed 10 feet in height and 8' in width.  
Exceptions:
  - A. Tall walls designed in accordance with IRC Table 602.3.1, Note b
  - B. Tall walls relying on engineered product designs in accordance with their listings contained in NER or IES research reports
4. Truss detail sheets, except layout drawings
5. Brick veneer lintel details that do not comply with the provisions of IRC, Figure 703.7.1.  
Note: All wood construction supporting brick veneer shall be designed for a maximum total deflection of  $L/600$ .
6. Roof designs that do not comply with section V.2 (Roof Systems) of this document.
7. Wall panels less than 2'8" wide that are required to be braced in accordance with IRC Section R602.10.3.  
Exception:
  - A. Braced walls that rely on engineered product designs in accordance with their listings.
  - B. Panels designed and installed in accordance with APA code proposals S80-03/04 and RB 178-03/04 (copies attached).